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While LÖWSCHIN admits that at present he is describing analogies, still he believes that these are too numerous and too striking to be merely accidental.—CHARLES J. CHAMBERLAIN.

**Recent work among gymnosperms.**—SAXTON<sup>39</sup> has investigated one of the two species of *Actinostrobus*, an endemic Australian genus, and therefore well worth investigation. An outline of the results is as follows. The microsporophyll bears three sporangia and about three months elapse between pollination and fertilization. The archegonia are numerous and deep-seated, "a group of 25-30 being found abutting on the lower end of each pollen tube, which reaches about halfway down the prothallus," the older cells of which are generally 2-nucleate or 4-nucleate. In proembryo-formation, walls are formed when the two free nuclei divide, so that there is a 4-celled proembryo. The completed proembryo, consisting of few cells, fills the egg. Each cell of the proembryo (with perhaps the exception of the two "apical cells") gives rise to a suspensor and an embryo-initial, being as independent in embryo-formation as are the proembryonal cells of *Ephedra*. The chromosome numbers are 8 and 16.

TAKEDA<sup>40</sup> has studied in detail the anatomy of the leaf of *Welwitschia* and concludes that the evidence is all in favor of the Gnetales being gymnosperms, as opposed to the view of LIGNIER and TISON. Even the tracheae, the most striking angiospermous anatomical feature, are in a transition stage, showing incomplete perforations.

TAKEDA<sup>41</sup> has developed a theory of the so-called "transfusion tissue" of gymnosperms. He finds that the "orthodox" transfusion tissue always arises laterally, and is quite independent of centripetal xylem. Therefore, it is not a vestige of the centripetal xylem and is not to be regarded as of phylogenetic significance, its function being "water-storing."—J. M. C.

**Gemmae in *Radula*.**—The development of gemmae in two species of *Radula* has been studied by Miss WILLISTON.<sup>42</sup> In *R. flaccida*, a native of tropical America, the gemmae occur on the dorsal margin of the leaves, and formation begins by the enlargement of a single cell around which a transparent gelatinous substance is secreted. A periclinal wall divides the gemma initial into a stalk cell which undergoes no further division, and an outer or mother cell which is divided by an anticlinal wall. The next division gives a quadrant, the two outer cells of which immediately function as apical cells with two cutting faces. The two inner cells of the quadrant do not produce apical cells.

<sup>39</sup> SAXTON, W. T., Contributions to the life history of *Actinostrobus pyramidalis* Miq. Ann. Botany **27**:321-345. pls. 25-28. 1913.

<sup>40</sup> TAKEDA, H., Some points in the anatomy of the leaf of *Welwitschia mirabilis*. Ann. Botany **27**:347-357. pl. 29. 1913.

<sup>41</sup> TAKEDA, H., A theory of "transfusion tissue." Ann. Botany **27**:359-363. 1913.

<sup>42</sup> WILLISTON, RUTH, Bull. Torr. Bot. Club **39**:329-339. figs. 37. 1912.